

Begin

#200

KAKHNOVSKAYA,  
L.T.

TO

KAKHNOVSKIY, I.M.; MELKUMOVA, I.S.

Diagnostic value of the diphenylamine reaction in a series of  
internal diseases. Lab. delo 7 no.10:8-11 0 '61. (MIRA 14:10)

1. Kafedra fakul'tetskoy terapii (zav. - deystvitel'nyy chlen  
AMN SSSR prof. V.N.Vinogradov) lechebnogo fakul'teta I Moskovskogo  
ordena Lenina meditsinskogo instituta imeni I.M.Sechenova.  
(DIPHENYLAMINE)

BONDAR', Z.A., prof.; UZIANOVA, V.L.; KAKHNOVSKIY, I.M.

Use of prednisolone in chronic hepatitis and liver cirrhosis.  
Sov. med. 25 no.3:96-104 Mr '61. (MIRA 14:3)

1. Iz kafedry fakul'tetskoy terapii lechebnogo fakul'teta (zav. -  
deystvitel'nyy chlen AMN SSSR prof. V.N.Vinogradov) i Moskovskogo  
ordena Lenina meditsinskogo instituta i .eni I.M.Sechenova.  
(PREGNADIENEDIONE) (LIVER-DISEASES)

KAKHNOVSKIY, I.M.

Associated diabetes mellitus with xanthomatous liver cirrhosis:  
Terap.arkh. 33 no.1:92-96 '61. (MIRA 14:3)

1. Iz fakul'tetskoy terapevticheskoy kliniki (dir. - deystvitel'-  
nyy chlen AMN SSSR prof. V.N. Vinogradov) I Moskovskogo ordena  
Lenina meditsinskogo instituta imeni I.M. Sechenova.  
(LIPIDOSIS) (LIVER—CIRRHOSIS) (DIABETES)

KAKHNOVSKIY, I.M.

Electro-oscillographic examination of peripheral arteries in myocardial infarct complicated with collapse. Sov. med. 28 no.1:20-27 Ja '65. (MIRA 18:5)

1. Kafedra fakul'tetskoy terapii (zav. -- deystvitel'nyy chlen AMN SSSR prof. V.N. Vinogradov [deceased]) I Moskovskogo ordana Lenina meditsinskogo instituta imeni Sechenova.

VETRA, K.; KAKHON, L. [translator]

[On the banks of the Abava] Na beregakh Abavy. Riga, Latv-  
viiskoe gos.izd-vo, 1959. 136 p. (MIRA 15:5)  
(Abava Valley—Description and travel)

KAKHNOVSKIY, I. M., BONDAR', Z. A., and UZYANOVA, V. I.

"Prednisolone Treatment of Chronic Hepatitis and Cirrhosis of the Liver"

report submitted to the All-Russian Conference of Internists, Leningrad,  
USSR 26-29 June 1960

So: Terapevticheskiy Arkhiv (Therapeutic Archives), Vol. XXXII, No. 11  
Moscow, Nov. 1960, pages 93-95



KAKHNOVSKIY, I.M.; UL'MER, N.S.

Methodology of electro-oscillography. Kardiologiya 5 no.2:84-  
85 Mr-Apr '65. (MIRA 18:7)

1. Kafedra fakul'tetskoy terapii (zav. - prof. V.N.Vinogradov)  
I Moskovskogo ordena Lenina Meditsinskogo instituta imeni I.M.  
Sechenova.

SHISHMAREVA, L.B.; GISIN, P.G.; MIROSHNICHENKO, G.Ya.; Prinimali  
uchastiye: SHEPPER, L.Ya.; KLEYEV, V.I.; KAKHOVSKAYA, N.I.

Optimum parameters of the process of painting the products  
by flow coating. Lakokras. mat. 1 ikh. prim. no.4:30-34 '61.  
(MIRA 16:7)

(Painting, Industrial)

KAKHOVSKIY, N. I.

USSR/Metallurgy - Welding, Methods

Oct 52

"Method of Welding by Electric Rivets Under Flux  
With Electrode Feed," N. I. Kakhovskiy, Engg

"Argon Delo" No 10, pp 18-22

Introduces method of welding with portable elec  
riveter feeding electrode for certain length into  
zone of arc after it is struck. Method permits  
the welding of 8 mm thickness without preliminary  
drilling of holes in pieces to be welded, while  
ordinary elec riveting method with stationary  
electrode gives good results in welding max 3 mm

231754

thicknesses of metal. Presents schematic elec  
diagram of installation and drawings of riveter.  
Discusses defects of elec rivets, causes of de-  
fects, and corrective measures.

231754

11 00 4054 IV, N. I.

Subject : USSR/Engineering  
Card 1/1 : Pub. 11 - 3/13  
Authors : Kasatkin, B. S. and Kakhovskiy, N. I.  
Title : Special features of the welding of Bessemer steel  
Periodical : Avtom. svar., 7, #5, 24-37, S-O 1954  
Abstract : The complicated deoxidation of Bessemer steel with liquid cast iron, ferrotitanium and aluminum is discussed. Variations in the microstructural and mechanical properties are analyzed in relation to the proportion of the deoxidizing additives. Eight tables, 23 charts, 2 microphotographs and 4 Russian references (1934-51).  
Institution : Institute of Electric Welding im. E. O. Paton  
Submitted : Je 15, 1954

AID P - 989

KAKHOVSKIY, N. I.

KAKHOVSKIY, N. I. -- "Some Welding Properties of Bessemer Steel." Min  
Higher Education USSR. Kiev Order of Lenin Polytechnic Inst. Kiev, 1955.  
(Dissertation for the Degree of Candidate of Technical Sciences.)

SO: Knizhnaya Letopis', No 5, Moscow, Feb 1956

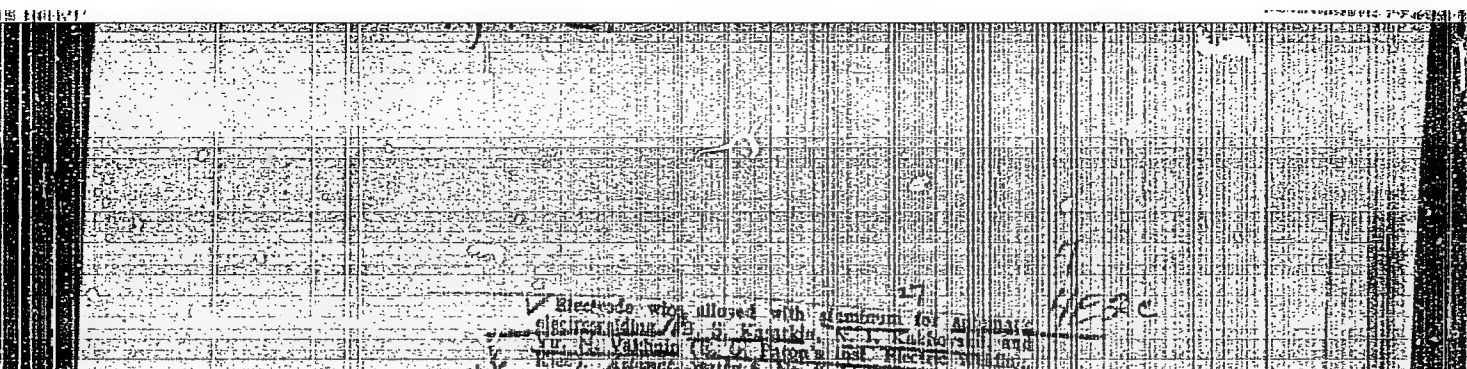
"APPROVED FOR RELEASE: 03/20/2001

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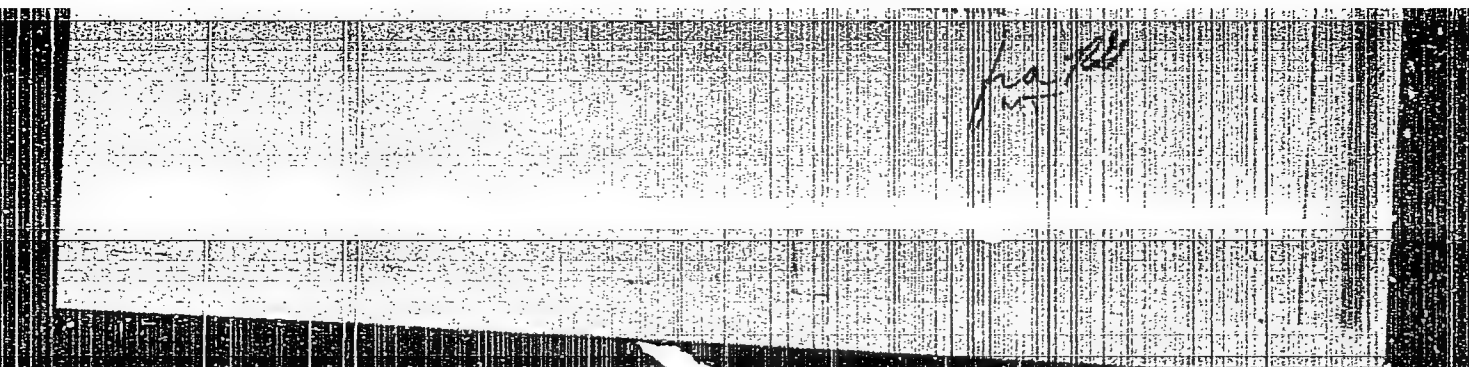
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*Kakhovskiy, N.I.*  
KASATKIN, B.S.; KAKHOVSKIY, N.I.; MALEVSKIY, Yu.B.

Investigating the structure of ferrite in Bessemer steel  
welds by means of an electron microscope. Avtom. svar. 8  
no.6:96-98 M-D '55. (MLRA 9:2)

1.Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki  
imeni Ye.O.Patona AN USSR.  
(Ferrite--Metallography) (Electron microscope)

KAKHOVSKIY, N. I.

AID P - 5413

Subject : USSR/Engineering

Card 1/1 Pub. 11 - 3/13

Authors : Kasatkin, B. S., N. I. Kakhovskiy, and Yu. N. Vakhnin

Title : Carbon dioxide welding of alloyed steels

Periodical : Avtom. svar., 9, 5, 19-21, My 1956

Abstract : The authors describe the results of experiments in the development of suitable electrodes for carbon dioxide welding of alloyed steels and present data on the powdered electrode wires as most adaptable to the purpose. Three graphs and 1 table; 2 Russian references (1955) and 1 German reference (1956).

Institution : Electrowelding Institute im. Paton.

Submitted : No date

КАКHOVSKIY, M.I.

KASATKIN, B.S., kand. tekhn. nauk; KAKHOVSKIY, M.I., kand. tekhn. nauk;  
YAKHIN, S.M., inzh.

Gas-electric welding of steam turbine diaphragms. Teploenergetika  
4 no.12:42-47 D '57. (MIRA 10:11)

1. Institut elektrosvarki USSR.  
(Steam turbines--Welding)

Kakhovskiy N.I.

Distr: LE13/152c

Automatic welding of low-alloyed steels with increased strength in carbon dioxide gas medium. B. S. Kabanov, N. I. Kakhovskiy, and Yu. N. Yashin. Atomat. Svarka No. 11, 1957. - Described in automatic elec. weld. of low alloyed steels of thickness 10 mm. C. 111 and 112. - 1957. - 11, 115. SKI 110 111 112. 113. 114. 115. Welding rods with approx. 0.12, Mn 2.1, Si 0.5% were used with normal fluxes in CO<sub>2</sub> gas with good results. - 3 references. E. P. Khilkevich

*KAKHOVSKIY, N.I.*  
**KAKHOVSKIY, N.I.; PONIZOVTSSEV, A.M.**

Welding St.4 and SKhL-1 steels in an atmosphere of carbon dioxide.  
Autom. svar. 10 no.5:61-63 S-O '57. (MIRA 10:12)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye.O.  
Patona AN USSR.  
(Steel--Welding) (Protective atmospheres)

*KAKHOVSKIY, N.I.*

KAKHOVSKIY, N.I.

Welding thin "chromansil" steel sheets with carbon dioxide  
protection. Avtom.svar. 10 no.6:55-58 N-D '57. (MIRA 11:1)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki in.  
Ye.O. Patona AN USSR.

(Chromium-manganese steel)  
(Protective atmospheres)

SOV-135-58-2-2/18

AUTHORS: Kakhovskiy, N.I., Candidate of Technical Sciences, and Ponizovtsev, A.M., Engineer

TITLE: The Automatic Welding of 20KhMA-Steel in Carbon Dioxide  
(Avtomaticheskaya svarka stali 20 KhMA v uglekislom gaze)

PERIODICAL: Svarochnoye proizvodstvo, 1958, Nr 2, pp 7 - 10 (USSR)

ABSTRACT: Information is presented on tests carried out on forged and heat treated "20KhMA" steel and on the development of electrode wires for welding this steel. The described experiments permitted the optimum seam metal composition to be obtained ( up to 0.10 % C; 0.9 to 1.5 % Mn; 0.25 to 0.45 % Si; 0.8 to 1.0 % Cr; 0.4 to 0.5 % Mo. ) which is ensured by the use of a powder wire ( 0.12 to 0.14 % C; 1.9 to 2.3 % Mn; 0.8 to 1.0 % Si; 0.8 to 1.1 % Cr; 0.4 to 0.5 % Mo and not over 0.03 % S and P) or a common wire ( up to 0.10 % C; 1.6 to 1.9 % Mn; 0.65 to 0.80 % Si; 0.8 to 1.1 % Cr; 0.4 to 0.5 % Mo and not over 0.03 % S and P).

~~There are 4 tables, 4 graphs, 1 diagram, 1 photo and 5 references, 4 of which are Soviet and 1 English.~~

ASSOCIATION: Institut elektrosvarki imeni Ye. O. Patona AN USSR (Institute of Electric Welding imeni Ye. O. Paton, AS UkrSSR)

AUTHOR: Kakhovskiy, N.I. SCV-125-58-2-4/11

TITLE: Structure and Properties of Zones Adjacent to Seams in "2Kh13" Steel Weld Joints (O strukture i svoystvakh okoloshovnoy zony svarnykh soyedineniy stali 2Kh13)

PERIODICAL: Avtomaticheskaya svarka, 1958, Nr 2, pp 30-36 (USSR)

ABSTRACT: As the existing data on the weldability of "2Kh13"-steel (0.16 - 0.24 % C; 12 - 14 % Cr) is contradictory, an examination of the structure, hardness and existence of cracks in zones adjacent to seams of such steel, welded in carbon dioxide was made. It was found, that this steel, up to a thickness of 12 mm, can be successfully welded without preheating according to specified optimum welding process parameters. In the zone adjacent to seams, heterogenous structure, composed of soft grains of low-carbon alloyed ferrite and hard grains of acicular ferrites, is formed. This causes increased hardness and brittleness of the metal. Subsequent high annealing at temperatures of 700° - 750° C is necessary for softening the metal and obtaining satisfactory quality of weld joints.

Card 1/2



SOV-125-59-2-4/11  
Structure and Properties of Zones Adjacent to Seams in "2Kh13" Steel Weld Joints

There are 4 graphs, 4 photos and 10 references, 7 of which are Soviet and 3 English.

ASSOCIATION: *ORDENA TRUDOVOGO KRASNOGO ZVANIENI*  
Institut elektrosvariki imeni Ye.O. Patona, AN USSR (Institute of Electric Welding imeni Ye.O. Paton, AS UkrSSR)

SUBMITTED: August 19, 1957

1. Steel--Welding

Card 2/2

AUTHORS: Kakhovskiy, N.I. and Ponizovtsev, A.M. SOV 125-58-3-15/15

TITLE: Automatic Welding of Movable Annular Butts Without Underlaid Support Rings (Avtomaticheskaya svarka povorotnykh kol'tsevykh stykov bez podkladnykh kolets)

PERIODICAL: Avtomaticheskaya svarka, 1958, Nr 3, pp 93-95 (USSR)

ABSTRACT: The article gives general information on different methods (Soviet and foreign) of welding annular butts without underlaid support rings, and describes a new technology of welding in carbon dioxide with the aid of a d.c. welding generator with special stable outer characteristics, developed at the Institute of Electric Welding imeni Ye.O. Paton. Tests were carried out on tubes of 529 mm in diameter, with a wall thickness of 8 mm. Great attention was devoted to obtaining a stable welding without burning the first seam layer. Different welding technologies and electrode positions were tested. The optimum welding technology which obtained satisfactory results is given in a table. A two-arc automatic device fed by two d.c. power sources is recommended. One of the arcs is used to weld the root layer in a semi-vertical position of the electrode. The second arc welds the next layer in a lower position of the

Card 1/2

SOV 125-58-3-15/15

Automatic Welding of Movable Annular Butts Without Underlaid Support  
Rings

electrode.

There are 2 diagrams, 3 photographs, 1 table and 7 references, 5 of which are Soviet, and 2 English.

ORDENA TROUDOVOGO PRASNOGO ZHANNENI

ASSOCIATION: Institut elektrosvarki imeni Ye.O. Patona AN USSR (Institute of Electric Welding imeni Ye.O. Paton AS UkrSSR)

SUBMITTED: September 16, 1958

1. Pipes--Arc welding    2. Arc welding--Equipment    3. Carbon  
dioxide--Performance    4. Arc welding--Test results

Card 2/2

USCOMM-DC-60049

KAKHOVSKIY, N.I.

125-58-4 6/15

AUTHOR: Kakhovskiy, N.I., Candidate of Technical Sciences

TITLE: The Welding of High-Chrome "2Kh13" Steel in Carbon Dioxide  
(Svarka vysokokhromistoy stali 2Kh13 v srede uglekislogo gaza)

PERIODICAL: Avtomaticheskaya Svarka, 1958, <sup>11</sup>/Nr 4, pp 44-54 (USSR)

ABSTRACT: Heat-resistant stainless steel "2Kh13" is extensively used for turbines and particularly for gas turbines. All welding on turbines has thus far been done manually. This article describes an experiment to find out if steel "2Kh13" can be welded automatically in carbon dioxide. The chemical composition of the steel used corresponded to the "GOST 5632-51" standard. The electrode wires "Sv-2Kh13" and "Sv-0Kh14" by "GOST 2246-54" and two experimental powder wires had the composition indicated in Table 4. The optimum content of alloying elements in the weld metal was found to be the following: chrome up to 13.0%, silicon 0.30-0.35%, titanium 0.15-0.25%. Specimens were tested on sensitivity to thermic aging and for long-run strength (100,000 hrs) at temperatures of 400° to 500° C. Standard wire "Sv-2Kh13" and "Sv-0Kh14" can be recommended (only for

Card 1/2

The Welding of High-Chrome "2Kh13" Steel in Carbon Dioxide

125-58-4-6/15

turbines working under temperatures below 450° C) with annealing in 700° C after welding. Further investigations are needed for assuring equal strength in long run of the weld and the base metal and better resistance of welds to cold cracks. The electric arc welding method in carbon dioxide, automatic and semi-automatic, of steel "2Kh13" is found to be very applicable. Austenitic electrode wire had proved unsuitable for the purpose. The article contains details on the experiments and test conditions; the specimens are shown in a drawing. There is 1 drawing, 6 photographs, 2 graphs, 8 tables, and 4 references, 3 of which are Soviet and 1 English.

ASSOCIATION: Institut elektrosvariki imeni Ye.O. Patona AN UkrSSR (Electric Welding Institute imeni Ye.O. Paton of the AS UkrSSR)

SUBMITTED: January 20, 1958

AVAILABLE: Library of Congress

Card 2/2

AUTHOR: Kakhovskiy, N.I., Candidate of Technical Sciences 125-58-6-7/14

TITLE: Structure and Properties of Zones Adjacent to Seams of Kh17N2-Steel Weld Joints (O strukture i svoystvakh okoloshovnoy zony svarnykh soyedineniy iz stali Kh17N2)

PERIODICAL: Avtomaticheskaya Svarka, 1958,<sup>11</sup> Nr 6, pp 64 - 75 (USSR)

ABSTRACT: The described experiments were carried out to find ways of welding "Kh17N2"-steel (up to 8 mm thickness) without pre-heating, i.e. eliminate pre-heating, which is an expensive, laborious and difficult operation. The changes in the micro-structure of the metal adjacent to welds were studied. The results of experiments proved that "Kh17N2" steel up to 8 mm thick can be successfully welded without pre-heating. Subsequent annealing at  $700 \pm 20^{\circ}$  C is necessary. The technology of experiments is described. There are 5 micro-photographs, 1 figure, 1 graph, 5 references, 3 of which are Soviet and 2 English.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki imeni Ye.O. Patona AN UkrSSR (Order of Labor "Red Banner" Institute of Electric Welding im. Ye. O. Paton, AS UkrSSR)

~~SECRET~~ 2

AUTHOR: Kakhovskiy, N.I. SOV-125-58-9-6/14

TITLE: Mechanical Properties of Joints in Acid-Resistant "Kh17" Steel Welded in Carbon Dioxide With Austenitic Rods (Mekhanicheskiye svoystva svarnykh ~~soyedineniy~~ kislotoykoystali Kh17, vy-polnyayemykh v uglekislom gaze austenitnoy provolokoy)

PERIODICAL: Avtomaticheskaya svarka, 1958, "Nr 9, pp 37-39 (USSR)

ABSTRACT: Experimental tests were carried out on welding "Kh17" steel in carbon dioxide with "Sv-OKh18N9" and "Sv-Kh25N20" electrodes (composition of which is given in a table) for the purpose of determining mechanical properties of welded joints. It was stated that the use of austenitic electrodes produces the necessary chemical composition of the weld metal, ensuring acid and scale resistance, as well as satisfactory mechanical properties, similar to those of the base metal. There are 3 tables and 1 Soviet reference.

~~Page 1/2~~

*Inst. Electro-welding in Ye. O. Paton, AS Ukr SSR*





18(7), 25(1), 28(1)

SOV/125-59-5-2/16

AUTHOR: Kakhovskiy, N.I., Candidate of Technical Sciences

TITLE: To Obtain High Durability of Welds when Automatic-alloy-Welding Steel 30 Kh GSA in Carbon Dioxide

PERIODICAL: Avtomaticheskaya svarka, 1959, Vol 12, Nr 5, (74)  
pp 22-27 (USSR)

ABSTRACT: The article presents experimental data on the dependency of the mechanical qualities of welds from the contents of chrome, manganese, molybdenum and vanadium after a special heat treatment. For the experiments, electrode wires were used, which contained different quantities of manganese and chrome. Some electrode wires also contained small quantities of molybdenum and vanadium. 10 mm thick V-shaped samples of steel type 30 KhGSA were welded without preheating and with carbon dioxide in three plies. The welding conditions were  $I = 340 - 360$  A;  $U = 28 - 30$  V;  $V = 23$  m/h and the output of carbon dioxide 1000 - 1100 l/h. It is shown, that the durability characteristics of weldmetal

Card 1/1  
2

Soviet re-

25(1)

S/125/60/000/03/002/018

D042/D001

AUTHORS: Kakhovskiy, N.I. and Ponizovtsev, A.M.

TITLE: Welding<sup>18</sup> and Patching Cavities in Castings<sup>18</sup> of "1Kh2ON3G3D2L" Steel in Carbon Dioxide

PERIODICAL: Avtomaticheskaya svarka, 1960, Nr 3, pp 12-18

ABSTRACT: Information is given on experiments with welding "1Kh2ON3G3D2L" ferrite-austenite steel which is to replace the rapidly wearing and corrosive "20GSA" steel used for blades and other parts of hydro-turbines. The development of welding technology for the new steel was the purpose of experiments conducted at the Khar'kovskiy turbinnyy zavod (Khar'kov Turbine Plant) /Ref. 1/, the TsNIITMASH /Ref. 2/ and the Institute of Electric Welding imeni Ye.O. Paton UkrSSR /Ref. 3/. The composition of the "1Kh2ON3G3D2L" steel is the following (in %): up to 0.10 C; 2.3 - 3.0 Mn; 0.3 - 0.5 Si; 18.5 - 20.5 Cr; 3.0 - 3.5 Ni; 1.8 - 2.3 Cu; and not more than 0.03 each of S and P. The porosity in welds in experiments with powder metal wire was eliminated by the addition of Na<sub>2</sub>SiF<sub>6</sub> into the wire composition

Card 1/2

25(1)

S/125/60/000/04/004/018  
D042/D006

AUTHORS: Kakhovskiy, N.I. and Ponizovtsev, A.M.

TITLE: Welding "1Kh2ON3G3D2L" and "20GSL" in Carbon Dioxide

PERIODICAL: Avtomaticheskaya svarka, 1960, Nr 4, pp 22-26 (USSR)

ABSTRACT: The described experiments were carried out to find the proper welding process conditions for welding the two above mentioned steels. It was suggested at a turbine plant to make cast-welded runners for hydraulic turbines, i.e. with blades of ferrite-austenite "1Kh2ON3G3D2L" steel welded to upper and lower rims made of "20GSL" steel. The article gives details of experiments carried out for this purpose with semiautomatic welding in CO<sub>2</sub>. "1Kh2ON3G3D2L" steel was made up of: 0.10% C, 3.0% Mn, 0.49% Si, 20.0% Cr, 3.0% Ni, 2.0% Cu, and "20GSL" steel of:

Card 1/2



S/125/60/000/012/011/014  
A161/A030

AUTHORS: Kakhovskiy, N.I.; Langer, N.A.; Ponizovtsev, A.M.  
TITLE: Electrode Wire for Welding Low-Alloy Steel Ship Hulls in Carbon Dioxide  
PERIODICAL: Avtomaticheskaya svarka, 1960, No. 12, pp. 75 - 78

TEXT: Welds made in CXЛ (SKhL) type ship hull steel by УОНН-13/45А (UONI-13/45A) electrodes in manual welding, as well as by Св-08Г2С (Sv-08G2S) wire semi-automatically in CO<sub>2</sub> have a low corrosion resistance in sea water. The reason for this is a lower electro-chemical potential in weld metal than in base metal, i.e., the weld forms the anode in the couple. An addition of 0.7 - 1.0% chromium to weld metal raises the corrosion resistance. The Electric Welding Institute im. Ye O. Paton has developed a new electrode wire that is recommended for use and called Св-08ХГС (Sv-08KhGS). Its chemical composition is: up to 0.10% C; 1.4 - 1.7% Mn; 0.60 - 0.85% Si; 0.8 - 1.1% Cr; maximum 0.3% Ni; and maximum 0.03% S and P (each). The experiments were carried out with powder wire of different compositions, made in a special machine by bending low-carbon steel tape into a pipe and filling the pipe simultaneously with powder. The filled pipe

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S/125/60/000/012/011/014  
A161/A030

Electrode Wire for Welding Low-Alloy Steel Ship Hulls in Carbon Dioxide

was pulled through a die to reduce diameter and compress the core. The composition of ship hull steel used in experiments, 10XCHD (10XCrSND) is: 0.09% C; 0.61% Mn; 0.80% Si; 0.89% Cr; 0.55% Ni; 0.40% Cu; max. 0.03% S and P (each). The mechanical properties of welds produced with all of the tried wires were satisfactory. There are 2 figures, 2 tables and 2 Soviet references. ✓

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye.O. Patona AN USSR (Electric Welding Institute "Order of the Red Banner of Labor" imeni Ye.O. Paton of the AS UkrSSR)

SUBMITTED: June 29, 1960

Card 2/2

KAKHOVSKIY, N. I. ; LANGER, N. A. ; YUSHCHENKO, K. A.

Electrodes for welding SKhL-type steel plating for ship hulls.  
Avtom. svar. 13 no.8:26-32 Ag '60. (MIRA 13:8)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki  
im. Ye.O. Patona AN USSR.  
(Ships--Welding) (Electrodes)

KAKHOVSKIY, Nikolay Ivanovich, kand.tekhn.nauk; GOTAL'SKIY, Yuzef  
Nikolayevich, kand.tekhn.nauk; TRUSECHENKO, Anton Antonovich,  
inzh.; ROMANOV, B.V., red.; SOROKINA, S.L., red.; KOZLOVSKAYA,  
M.D., tekhn.red.; PERSON, M.N., tekhn.red.

[Automatic and semiautomatic welding] Avtomaticheskaya i polu-  
avtomaticheskaya svarka. Moskva, Vses.uchebno-pedagog.izd-vo,  
1961. 422 p. (MIRA 14:12)

(Electric welding)

27030

S/125/61/000/002/002/013

A161/A133

1.2300

AUTHOR: Kakhovskiy, N. I.

TITLE: Carbon dioxide-shielded welding of X17H2 (Kh17N2) steel

PERIODICAL: Avtomaticheskaya svarka, no. 2, 1961, 33-39

TEXT: Information is given on the technique and the results of tests. The Kh17N2 steel grade is a high-strength structural grade that is also used for gas turbine parts for service not exceeding 500°C, and can replace the "18-8" grade in chemical equipment where the concentration of nitric acid is not higher than 56%. No data are available on machine welding of this steel, and the purpose of the tests was to develop a technology for the CO<sub>2</sub>-shielded process. The Kh17N2 is a standard steel (GOST 5632-51 standard) of the following composition: (%) 0.11 - 0.17 C, up to 0.8 Mn, up to 0.8 Si, 16-18 Cr, 1.5 - 2.5 Ni. It needs tempering at 680 - 720°C after welding because of a heterogeneous structure forming at the weld - soft low-carbon alloyed δ-ferrite grains and martensite-like acicular grains. The tested electrode wires were:

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27030

S/125/61/000/002/002/013

A161/A133

Carbon dioxide-shielded welding ...

temperatures. The positive effect of Ti consisted in the refining and des-orienting action on the crystalline structure, and the ferritizing effect of it was weakened by Mn as well as C migrating in higher quantities from the wire into the weld metal in the presence of Ti. The obtained data show that welds with more than 14% Cr were subject to embrittlement if held for some time at temperatures of 400 - 500 °C; Kh17N2 steel tended to aging at 450 - 500 °C. Both the base metal and welds had a low impact strength at room temperature after aging, but satisfactory impact strength at high temperatures. Tempering at 600-700 °C eliminated the brittleness of the aged metal, but longer holding at critical temperatures made it brittle again, which is apparently due to the changing lattice of  $\delta$ -ferrite. The acid resistance of welds from Sv-08Kh18N2GT wire was equal to the acid resistance of the base metal. It is recommended to use the Sv-08Kh18N2GT of a composition corresponding to the 4MTY277-60 (ChMTU 277-60) standard specification, containing up to 0.10% C, 0.9 - 1.3% Mn, 0.25 - 0.65% Si, 17.0 - 19.0% Cr, 2.0 - 2.5% Ni, 0.8 - 1.3% Ti, and not more than 0.03% S and P respectively. The Sv-06Kh14 and Sv-08Kh14GT (the latter developed for the welding 2X13 (2Kh13) of high-chromium steel) can be used for joints intended for service at maximum 400 °C. The composition of the Sv-08Kh14GT is not given.

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27030

S/125/61/000/002/002/013  
A161/A133

Carbon dioxide-shielded welding ...

It is a standard wire (GOST 2246-60). Engineer Z. V. Yushkevich is mentioned as having carried out the corrosion tests. There are 4 figures, 4 tables and 4 Soviet-bloc references.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye. O. Patona AN USSR (Electric Welding Institute "Order of the Red Banner of Labor im. Ye. O. Paton AS UkrSSR)

SUBMITTED: June 24, 1960

Card 4/4

S/125/61/COO/011/003/012  
D040/D113

AUTHORS: Kakhovskiy, N.I., Ponizovtsev, A.M., Vasil'yev, V.G., and  
Lents, R.O.

TITLE: Welding of combination joints of 15Kh11MFB steel with 15Kh1MF  
and 20 KhMF steels in CO<sub>2</sub>

PERIODICAL: Avtomaticheskaya svarka, no. 11, 1961, 20-26

TEXT: Results are given of experiments, conducted to work out recommendations  
for the welding in CO<sub>2</sub> of the new heat-resistant 15X11MΦБ (15Kh11MFB)  
steel, proposed by the Leningradskiy metallicheskiy zavod (Leningrad Metal  
Plant). Data is given on the welding of combined joints of this steel with  
pearlitic steels used for steam turbines - 15X1M1Φ (15Kh1MF) and 20XMΦ  
(20KhMF). Their composition is as follows: ✓

Card 1/4

S/125/61/000/011/003/012  
DO40/D113

Welding of combination joints ...

lowed by 10 hours tempering at 720°C with cooling in furnace to 200-250°C and finally in the open air. Somewhat higher hardness in the fusion zone, compared to the weld and base metal was due to higher content of carbides, but the mechanical strength of the joints was satisfactory. Semiautomatic annular butt welding in pipes with 30-40 mm walls was carried out in the horizontal position with pipe edges shaped into an unsymmetric U; the weld root was welded with 1.0 mm wire, d.c. of 180-200 amp, 20-22 v, and the beads with 1.6 mm wire, 230-250 amp, 26-28 v. Two different semiautomatic welders were used for wire of different diameter and into the welding circuit was connected an PCT9-24 (RSTE-24) choke, which reduced spatter and stabilized the arc. ~~Св-08KhGSMF~~ (Sv-08KhGSMF) and ~~Св-08X2ГСМФ~~ (Sv-08Kh2GSMF) welding wires can be used for the pearlitic steel. Data on wires of this type is to be found in other Soviet publications (Ref. 1: B.S. Kasatkin, Yu.N. Vakhnin, "Avtomaticheskaya svarka", no. 3, 1958; Ref. 2: B.S. Kasatkin, Yu.N. Vakhnin, "Avtomaticheskaya svarka", no. 11, 1959). The following conclusions were drawn: (1) Sv-08KhGSMF and Sv-08Kh2GSMF wire may be employed; (2) Semiautomatic CO<sub>2</sub> welding of annular joints must be

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S/125/62/000/002/007/010  
D040/D113

AUTHORS: Kakhovskiy, N.I.; Yushchenko, K.A.; Fartushnyy, V.G.

TITLE: Welding materials for new stainless and acidproof steels with low nickel content

PERIODICAL: Avtomaticheskaya svarka, no. 2, 1962, 89-90

TEXT: Welding wire and electrode and flux grades to be used for new Soviet steels developed as substitutes for steels with 9-12% Ni are recommended. According to TsNIICHM data, the applications of the new steels are as follows:

Substitutes	Replaced steel	Approximate applications of the substitutes
X14Г14Н (Kh14G14N), X14Г14Н3Т (Kh14G14N3T),	OX 18Н9 (OKh18N9), 1X18Н9 (1Kh18N9),	For service under atmospheric conditions and in weakly corrosive media (food industry, etc, oxygen machinery) at up to -196°C. ✓

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Welding materials for .....  
Table continued

5/125/62/000/002/007/010  
D040/D113

X28 AH (Kh26AN),  
OX21H3T (OKh21N3T),  
1X21H5T (1Kh21N5T),  
OX21H5T (OKh21N5T),  
X18N2AG5 (Kh18N2AG5),

OX18H9 (OKh18N9),  
1X18H9T (1Kh18N9T),

In various branches of chemical,  
food, and coke-gas industries.

X17H4AG7 (Kh17N4AG7).  
X17H5G9AB (Kh17N5G9AB)  
and allied grades

1X18H9T (1Kh18N9T),  
1X18H9 (1Kh18N9),  
2X18H9 (2Kh18N9),

In chemical, petroleum, food,  
electrical and other industries.  
Recommended also as nonmagnetic  
steel.

OX21H6M2T (OKh21N6M2T),  
X17H6M2T (Kh17N6M2T)  
and allied grades.

1X18H12M2T (1Kh18N12M2T),  
1X18H12M3T (1Kh18N12M3T)  
For service in corrosive media  
(acetic, lactic, formic and  
oxalic acids); not recommended  
for service in nitric acid.

Card 2/3

34458  
S/125/62/000/003/003/006  
D040/D113

121130

AUTHORS: Kakhovskiy, N.I., Fartushnyy, V.G., and Yushkevich, Z.V.

TITLE: Welding Kh18N2AG5 thin sheet steel

PERIODICAL: Avtomaticheskaya svarka, no. 3, 1962, 27-31

TEXT: The techniques and results are given of welding experiments with a new austenite-ferritic steel, **X18H2AG5** or **ЭП-26** (Kh18N2AG5, or EP-26), developed by the Moskovskiy aviatsionnyy tekhnologicheskii institut (Moscow Aviation Technological Institute) and suggested for use in the manufacture of chemical, textile and food-processing equipment. The composition of Kh18N2AG5 per **ЧМТУ 57-58** (ChMTU 57-58) is:  $\leq 0.1\%$  C,  $\leq 0.8\%$  Si,  $\leq 0.030\%$  S,  $\leq 0.035\%$  P,  $4\div 6\%$  Mn,  $17\div 20\%$  Cr,  $1.5\div 2.5\%$  Ni, and  $0.15\div 0.25\%$  N. Steel used in experiments was 3 mm thick. About 40%  $\alpha$  phase was revealed in it by X-ray structural analysis. Automatic subarc and gas-shielded arc welding was tried and an **АН-26** (AN-26) welding flux and two standard electrode wire grades were used. Welds were tested for mechanical properties and corrosion.

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S/125/62/000/003/003/008  
D040/D113

Welding Kh18N2AG5 ...

The test results show that embrittlement occurs at 475°C, there is no tendency to intercrystalline corrosion before heat treatment, and a very high tendency to it after 2.5 hrs heating at 650°C with subsequent air cooling. Subsequent heating for 2.5 hrs at 850°C eliminated the tendency to intercrystalline corrosion but did not completely restore the general corrosion resistance in boiling 56% nitric acid. The following conclusions were drawn: (1) The Kh18N2AG5 (EP-26) steel can be used as a substitute for 18-8 type steels in the fabrication of welded equipment for chemical and food-processing machinery; (2) any arc welding process can be used for welding this steel; (3) welds produced under normal conditions (with moderate power per unit length) need no subsequent heat treatment. However, a tendency to intercrystalline corrosion develops after long-term holding within the critical temperature range (500-800°C). Minimum possible current at maximum speed must be used; (4) the 0X18H9 $\phi$ 2C (3H-606) [OKh18N9F2S (EI-606)] and C<sub>8</sub>-10X 20H15 (Sv-10Kh20N15) wire grades can be used for subarc process and for CO<sub>2</sub> welding; (5) further investigations are necessary for welding Kh18N2AG5 steel of more than 3 mm thickness. There

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36572

S/125/62/000/005/010/013  
D040/D113

1.2300

AUTHORS: Kakhovskiy, N.I. and Yushchenko, K.A.

TITLE: Electroslog welding of 10Kh14NDL high-chromium steel

PERIODICAL: Avtomaticheskaya svarka, no. 5, 1962, 92-93

TEXT: The Institut elektros arki im. Ye.O. Patona (Electric Welding Institute im. Ye.O. Paton) investigated the weldability of 10 X 14H<sub>14</sub>Л (10Kh14NDL) martensitic high-chromium steel which is to replace the cavitation-prone 20ГЦЛ (20GSL) grade now used for water turbines. Preliminary tests of 10Kh14NDL for cavitation and wear resistance gave satisfactory results. As electroslog welding is already being used in the production of radial-axial-flow turbine wheels, the Institute developed electroslog welding techniques with consumable plate electrode for joining 10Kh14NDL and 20GSL with 10Kh14NDL elements of up to 100 mm thickness. For welds in 10Kh14NDL it is recommended to use ЦБ-10X13 (Sv-10Kh13) and ЦБ-X25H13 (Sv-Kh25N13) filler wires, and an АНФ-6А (ANF-6A) flux. The consumable plate is made of 5 mm thick strip of 10X13 (10Kh13) steel.

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S/125/62/000/005/010/010  
DO40/D113

Electroslag welding of ....

and the spirals are made of the same steel as the filler wire. The process is conducted with 2 electrodes, electrode feed rate of 140±160 m/hr, 37±39 v, 35-40 mm slag bath depth, two welding electrodes 3 mm in diameter. Preheating unnecessary, but post-tempering for 6-12 hr at 700±20°C is required, with furnace cooling to 250°C and subsequent air cooling. The use of chromium-nickel wire ensures high plasticity of weld metal without heat treatment, but lower yield limit than in the base metal. No cracks were found in welds and in the weakness zone after welding when the recommended technique was used. 20GSL can be welded to 10Kh14NDL steel with Sv-Kh25N13 wire, an AHC-6 (ANF-6) flux, and the same consumable plate as in welding 10Kh14NDL, but with a 10 mm cladding sheet of X 25H20 (Kh25N20) steel welded to the edge of the 20GSL steel element to obtain 18-8 type metal. Subsequent high tempering eliminates the slight hardening of the 10Kh14NDL steel element at the weld and makes the joint plastic. Carbonization and increased hardness caused by tempering in the fusion line with 20GSL steel must be eliminated by normalization at 1020°C with subsequent tempering at 700°C. The welding of 100 mm thick joints between 10Kh14NDL and 20GSL is to be done with electrode feed of 150±170 m/hr, 39±41 v, slag bath depth

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S/125/62/000/007/007/012  
D040/D113

AUTHORS: Kakhovskiy, N.I., and Fartushnyy, V.G.

TITLE: Welding technology for stainless Kh14G14N3T (EI711) steel

PERIODICAL: Avtomaticheskaya svarka, no. 7, 1962, 71-80

TEXT: X14Г14Н3Т (Kh14G14N3T) or ЭИ711 (EI711) is a low-temperature steel developed by the TsNIIchermet and recommended for the oxygen industry as a substitute for "18-8" steel. Experiments are described in which the proper technology has been found for manual, automatic submerged-arc, and CO<sub>2</sub>-shielded welding of this steel. The composition of Kh14G14N3T per ГОСТ 5632-61 (GOST 5632-61) is as follows: ≤ 0.1% C, 13-15% Mn, ≤ 0.8% Si, 13-15% Cr, 2.5-3.5% Ni; (C-0.02) × 5 ÷ 0.6% Ti, ≤ 0.02% S, ≤ 0.035% P. Steel supplied for experiments from the "Elektrostal'" Plant contained 0.09% C, 13.67% Mn, 0.33% Si, 14.40% Cr, 3.11% Ni, and 0.50% Ti. The results of experiments are shown in tables and photomicrographs. Conclusions: This steel can be used as a substitute for "18-8" in welded equipment destined for service under pressure at temperatures down to -196°C, is weldable by any arc welding process and requires no heat treatment after welding. ✓

Card 1/3

S/125/62/000/007/007/012  
D040/D113

Welding technology for .....

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im.  
Ye.O. Patona AN USSR (Electric Welding Institute "Order of the Red  
Banner of Labor" im. Ye.O. Paton, AS UkrSSR)

SUBMITTED: July 13, 1961

Card 3/3

43199

8/125/62/000/012/001/004  
A006/A101

1.2300

AUTHORS: Kakhovskiy, N. I., Fartushnyy, V. G., Yushchenko, K. A., Didebulidze, D. V.

TITLE: Investigating intercrystalline corrosion of the weld-adjacent zone metal in X 28 AH (Kh28AN) steel welded structures

PERIODICAL: Avtomaticheskaya svarka, no. 12, 1962, 1 - 8

TEXT: The investigation was made with 2 mm thick steel, containing (in %): C 0.14, Mn 0.61, Si 0.42, Cr 25.7, Ni 1.64, N 0.142. This steel is not prone to intercrystalline corrosion in delivery state. However, after heating during the welding process (high-temperature heating and rapid cooling) sensitivity to intercrystalline corrosion appears in the weld-adjacent zone of this steel. The authors assume that this phenomenon may be caused a) by the impoverishment in chromium of the austenite phase contacting the ferrite (during heating over 950°C) and b) by the formation of thin non-stable austenite interlayers along the ferrite grain boundaries, which are poor in Cr and are rapidly decomposed according to kinetics of martensite transformation. As a result, the resistance of the

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Investigating intercrystalline corrosion of...

S/125/62/000/012/001/004  
A006/A101

steel to intercrystalline corrosion is reduced. This defect can be eliminated by subsequent tempering. The excess carbon is singled out of the martensite layers, forming complex carbides along the grain boundaries with prevailing Cr content. The boundary layers are softened. Simultaneously with carbide separation, the chromium is diffused from the central zones of ferrite grains to the impoverishing boundary zones, and also from the ferrite into the austenite phase (at sufficiently high tempering temperatures). As a result, the Cr content in the grains of both phases is equalized and the steel acquires its initial corrosion resistance. Full stabilization is achieved by tempering at 800 - 850°C during 1.5 - 2.5 hours. There are 6 figures and 1 table.

ASSOCIATION: Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki im. Ye. O. Patona AN USSR (Order of the Red Banner of Labor Institute of Electric Welding imeni Ye. O. Paton, AS UkrSSR)

SUBMITTED: June 11, 1962

Card 2/2

KAKHOVSKIY, N.I.; FARTUSHNIY, V.G.

Technology of welding Kh14G14N3T (E1711) stainless steel. Avtom.  
svar. 15 no.7:71-80 J1 '62. (MIRA 15:7)

1. Ordena Trudovogo Krasnogo Znamenii institut elektrosvarki imeni  
Ye.O. Patona AN USSR.  
(Steel, Stainless—Welding)

KAKHOVSKIY, Nikolay Ivanovich [Kakhovs'kyi, M.I.], kand. tekhn.nauk;  
DEREVETS, S.K., red. izd-va; STARODUB, T.O., tekhn. red.

[A manual on electric welding] Posibnyk elektrozvarnyka. Kyiv,  
Derzhstekhydav URSR, 1962. 302 p. (MIRA 16:2)  
(Electric welding--Handbooks, manuals, etc.)



KAKHOVSKIY, N. I.; YUSHCHENKO, K. A.; YUSHKEVICH, Z. V.; ISTRINA, Z. F.

Electric arc welding of corrosion resistant OKh21N6M2T  
ferritic-austenitic steel. Avtom. svar. 15 no.11:16-24  
N '62. (MIRA 15:10)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki  
imeni Ye. O. Patona AN UkrSSR (for Kakhovskiy, Yushchenko,  
Yushkevich). 2. Vsesoyuznyy nauchno-issledovatel'skiy i  
konstruktorskiy institut khimicheskogo mashinostroyeniya  
(for Istrina).

(Steel, Stainless—Welding)

KAKHOVSKIY, N.I.; FARTUSHNYY, V.G.; YURCHENKO, K.A.; DIDEBULIDZE, D.V.

Investigating intercrystalline corrosion in the weld metal  
zone in welded Kh28AN steel. Avtom. svar. 15 no.12:1-8  
D '62. (MIRA 16:2)

1. Ordena Trudovogo Krasnogo Znameni institut elektrosvarki  
imeni Ye.O. Patona AN UkrSSR.  
(Chromium steel—Welding)  
(Metals, Effect of temperature on)

KAKHOVSKIY, Nikolay Ivanovich, kand. tekhn. nauk; GGTAL'SKIY,  
Yuzef Nikolayevich, kand. tekhn. nauk; PATON, Vladimir  
Yevgen'yevich, kand. tekhn. nauk; TRUSHCHENKO, Anton  
Antonovich, inzh.; ZVEGINTSEVA, K.V., nauchn. red.;  
GORJUNOVA, L.K., red.; NESMYSLOVA, L.M., tekhn.red.

[Technology of mechanized arc and electric slag welding]  
Tekhnologiya mekhanizirovannoi dugovoi i elektroshlakovoi  
svarki. [By] N.I.Kakhovskii i dr. Moskva, Proftekhizdat,  
1963. 383 p. (MIRA 17:1)

(Electric welding--Equipment and supplies)

S/125/63/000/003/006/012  
A006/A101

AUTHORS: Kakhovskiy, N. I., Fartushnyy, V. G.

TITLE: Welding thin-sheet X28 AH (Kh28AN) steel with a submerged arc and in CO<sub>2</sub>

PERIODICAL: Avtomaticheskaya svarka, <sup>16</sup>no. 3, 1963, 53 - 55

TEXT: The investigation was made with sheet steel  $\delta = 2$  mm containing in per cent: C 0.14; Mn 0.61; Si 0.42; Cr 25.7; Ni 1.64; N 0.142. The mechanical properties of the steel in finished state are:  $\sigma_t = 48.5$  kg/mm<sup>2</sup>;  $\sigma_v = 6.21$  kg/mm<sup>2</sup>;  $\delta_5 = 20.8\%$ ;  $\psi = 66.6\%$ ;  $a_n = 6.6$  kgm/cm<sup>2</sup>;  $\alpha = 180^\circ$ . In welding with a closed arc welding wire CB-08X19H9Φ202 (Sv-08Kh19N9F2S2) and CB-08X20H9Γ7T (Sv-08Kh20N9G7T), 2 mm in diameter, were used in combination with flux AN-26 (AN-26); for welding in CO<sub>2</sub> (140 - 150 amp; current; 22 - 23 v arc voltage, 30 m/hour welding speed) wire 08X20H902BTU (08Kh20N9S2BTyU) was employed. The butts were welded on a copper backing plate. The following results are obtained. Steel Kh28AN can be partially used to replace 18-8 type steels in manufacturing welded equipment for chemical, food, and other industries.

Card 1/2

Welding thin sheet X 28 AH (Kh28AN) steel with...

S/125/63/000/003/006/012  
A006/A101

Steel Kh28AN can be welded by any type of the arc process. As was shown in a previous investigation, proneness to intercrystalline corrosion, determined by the standard AM method, is shown under the effect of the heat cycle in the weld-adjacent zone of Kh28AN steel joints. However, in a number of media of moderate aggressiveness, (including boiling nitric acid of up to 50% concentration) weld joints of this steel are resistant to intercrystalline corrosion without heat treatment. For automatic welding with a submerged arc, welding wires Sv-08Kh19N9P232, and Sv-08Kh20N9G7T can be used in combination with AN-26 flux. For welding in CO<sub>2</sub> wire OKh20N9S2BTYu can be used. It is necessary to conduct further investigations of the weldability of Kh28AN steel,  $\delta > 3$  mm, and to make more precise the welding techniques by taking into account the operational conditions of equipment manufactured of this steel grade. There are 2 tables and 1 figure.

ASSOCIATION: Institut elektrosvarki imeni Ye. O. Patona, AN USSR (Institute of Electric Welding imeni Ye. O. Paton, AS UkrSSR)

SUBMITTED: June 11, 1962

Card 2/2

DOLGINOV, I.M., inzh.; IL'YENKO, N.P., inzh.; KAKHOVSKIY, N.I., kand.tekhn.  
nauk; YUSHCHENKO, K.A., inzh.

Adoption of OKh21N5T steel welding in the chemical machinery industry. Mashinostroenie no.4:67-70 J1-Ag. '63. (MIRA 17:2)

1. Kiyevskiy zavod "Bol'shevik" (for Dolginov, Il'yenko). 2. Institut elektrosvarki im. Ye.O.Patona AN UkrSSR (for Kakhovskiy, Yushchenko).

8/125/63/000/004/010/011  
D040/D112

AUTHORS: Kakhovskiy, N.I., and Didebulidze, D.V.  
TITLE: Arc welding high-alloy ferrite steels  
PERIODICAL: Avtomaticheskaya svarka, no. 4, 1963, 85-86

TEXT: The Institut elektrosvarki im. Ye.O. Patona (Electric Welding Institute im. Ye.O. Paton) investigated the weldability of X17 (Kh17), X17T (Kh17T), OX17T (OKh17T), X17M2T (Kh17M2T), X17M2B (Kh17M2B), and X25T (Kh25T) ferritic corrosion-resistant steels, and the effect of the ratio of the content of stabilizers (titanium, columbium, molybdenum) to that of carbon on the intercrystalline corrosion resistance of heat-affected metal at the welds. Recommendations are given concerning these ratios, the nickel-chromium ratio, and the nickel content in welds alloyed with molybdenum, vanadium or manganese. It is recommended to produce an austenitic and ferritic or ferritic and austenitic (55% or more ferrite) structure to improve the plasticity of welds, and to carry out tempering at 760-780°C

Card 1/2

Arc welding high-alloy . . .

S/125/63/000/004/010/011  
D040/D112

to prevent intercrystalline corrosion in welds in steel with a titanium-carbon ratio below 6. The trade names of electrodes, wires and fluxes recommended for different arc welding processes and different service requirements are given in a table. There is 1 table.

Card 2/2



KAKHOVSKIY, N.I.; YUSHCHENKO, K.A.

Effect of the welding heat on the microstructure and properties  
of 21-3 and 21-5 type steels. Avtom, svar, 16 no.10:15-25  
O '63. (MIRA 16:12)

1. Institut elektrosvariki imeni Y.O. Patona AN UkrSSR.

KAKHOVSKIY, N.I.; YUSHCHENKO, K.A.; YUSHKEVICH, Z.V.; BABAKOV, A.A.;  
KAREVA, Ye.N.; SHARONOVA, T.N.

Electric arc welding of corrosion-resistant ferrite-austenite  
steels of the type 21-3 and 21-5. Avtom. svar. 16 no.12:49-57  
D '63. (MIRA 17:1)

1. Institut elektrosvariki imeni Patona AN UkrSSR (for  
Kakhovskiy, Yushchenko, Yushkevich). 2. Tsentral'nyy nauchno-  
issledovatel'skiy institut chernoy metallurgii (for Babakov,  
Kareva). 3. Gosudarstvennyy nauchno-issledovatel'skiy i  
proyektnyy institut azotnoy promyshlennosti i produktov  
organicheskogo sinteza (for Sharonova).

L 10302-63

BNP(q)/BNT(m)/BDS--AFFTC/ASD--JD/MM/JT

ACCESSION NR: AP3001116

S/0125/63/000/007/0021/0028

AUTHOR: Kakhovskiy, N. I.; Yushchenko, K. A.; Fartushnyy, V. G.; Yushchenko, Z. V.

TITLE: Welding of corrosion-resistant austenitic OKh17N5G9AB (EP55) chromium-nickel-manganese-nitrogen steel

SOURCE: Avtomaticheskaya svarka, no. 7, 1963, 21-28

TOPIC TAGS: OKh17N5G9AB steel, nitric-acid-resistant steel, welding of OKh17N5G9AB steel, Ch18N10T steel

ABSTRACT: Effects of short-time welding heating and provoking heating at 650C on the corrosion resistance of the above steel and its welded joints were investigated. The steel has been used in the nitric-acid production equipment. The carbon-dioxide-blanketed submerged-arc automatic welding was specifically studied; the best welding conditions and welding wire were found. Mechanical and corrosion characteristics of welds were determined and compared with those of Ch18N10T steel. The following conclusions are offered: (1) any type of arc welding is applicable without subsequent heat treatment; (2) welding wire of the same steel with Ts111 coating can be used for manual welding; (3) V and Si, over 1 per cent of each, are

Card 1/2

ACCESSION NR: AP4029254

8/0125/64/000/004/0021/0026

AUTHOR: Kakhovskiy, N. I. (Candidate of technical sciences); Yushchenko, K. A.  
(Engineer)

TITLE: Effect of vanadium and silicon on the characteristics of chromium-nickel  
ferritic-austenitic welds

SOURCE: Avtomaticheskaya svarka, no. 4, 1964, 21-26

TOPIC TAGS: OKh21N5T steel, steel weld, corrosion resistance,  
21-5 steel, CrNi steel

ABSTRACT: It has been known that alloying chromium-nickel-manganese austenitic and chromium-nickel ferritic-austenitic welds with  $>0.0\%$  V (and especially with  $>1\%$  V-Si, although resulting in a resistance to intergranular corrosion, greatly impairs the general corrosion resistance of the metal in nitric acid. The effect of these elements on the weld metal was therefore investigated in low-nickel steels. Experimental welds in OKh21N5T steel were made by submerged-arc welding with ANF-6 flux and with a welding wire from the same steel. Ferrovandium or ferrosilicon was put into the cut grooves. It was found that over a

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L 19736-65  
 ACCESSION NR: AP4044915  
 EMP(e)/EWT(m)/EWA(d)/EWP(v)/EWP(t)/EWP(k)/EWP(l)  
 HW/TB S/0226/64/000/004/0091/0096  
 AUTHOR: Lakhovskiy, N. I.; Poninoytsev, A. M.; Andrievskiy, N. A.;  
 Solonin, I. M.

TITLE: Welding of porous high-alloy Kh17N2 steel

SOURCE: Poroshkovaya metallurgiya, no. 4, 1954 91-96

TOPIC TAGS: stainless Kh17N2 steel, sintered Kh17N2 steel, sintered stainless steel welding, weld metal property, weld metal corrosion resistance

ABSTRACT: Plates, 40 x 60 x 3 mm, and bushings, 50--70 mm in diameter with a porosity varying from 30 to 60%, made by the powder metallurgy method from Kh17N2 stainless steel powder (0.1% C, 16.9% Cr, 2% Ni, 0.15% Ni), were TIG welded with or without filler wire, or CO<sub>2</sub> welded with a consumable electrode. TIG welding without filler wire produced sound welds in steel with a porosity up to 30%. The optimum conditions for welding 5-mm thick metal were: electrode

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L 15736-65  
ACCESSION NR: AP4044915

diameter, 1.0--1.2 mm; current, 70--80a; voltage, 8--9v; welding speed, 18--22 m/hr. For thinner metal the current should be lower. Filler wire should be used in welding metal with a higher porosity. In both argon-arc and consumable-electrode CO<sub>2</sub> welding of porous, high-alloy austenitic and martensitic steels, austenitic standard filler wire Sv-08Kh20N9G7T, Sv-08Kh20N10G6, Sv-10Kh20N15, or Sv-06Kh18N9T produce weld metal with satisfactory microstructure, mechanical properties, corrosion resistance, and ductility. In consumable-electrode CO<sub>2</sub> welding, the electrode diameter should be 0.6--0.7 mm max. Annealing in dry hydrogen at 1200C for 1 hr and subsequent normalization improve corrosion resistance of metal in the heat-affected zone. The annealing, however, decreases the microhardness of the weld metal from 170 to 75--90 dan/mm<sup>2</sup> and that of the parent metal from 100--180 to 75--120 dan/mm<sup>2</sup>. A somewhat higher porosity was observed in the fusion zone, although in the annealed metal it appeared to be uniform. Orig. arc. has: 5 figures and 1 table.

Card 2/3

L 15735-65

ACCESSION NR: AP4044915

2  
ASSOCIATION: Institut Elektrosvarki Im. Ye. O. Patona AN UkrSSR  
(Electrowelding Institute AN UkrSSR); Institut problem materialoved-  
eniya AN UkrSSR (Institute of the Science of Materials AN UkrSSR)

SUBMITTED: 17Apr63

SUB CODE: HM, IE

NO REF SOV: 002

EXCL: 00

OTHER: 002

Card 3/3

ACCESSION NR: AP4039764

S/0125/64/000/006/0014/0018

AUTHOR: Kakhovskiy, N. I.; Fartushnyy, V. G.

TITLE: Effect of manganese on the structure and properties of high-chromium welds

SOURCE: Avtomaticheskaya svarka, no. 6, 1964, 14-18

TOPIC TAGS: stainless steel, chromium stainless steel, steel weld, manganese alloy weld, weld corrosion resistance, weld intergranular corrosion

ABSTRACT: The effect of manganese on properties of the metal of submerged arc welds in Kh17T chromium steel made with Sv-06X19H9T electrode wire has been investigated. Manganese was put into weld grooves. As the manganese content increased to 12—13%, the austenite content of the weld metal increased to 90—95%. A further increase of Mn content somewhat decreased the content of austenite. Elongation, reduction of area, and notch toughness increased continuously as the manganese content increased to 10—12%. However, both hardness and yield strength dropped with the increase of manganese content to 9—10%. The optimal

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ACCESSION NR: AP4039764

combination of mechanical properties of weld metal containing 17.0—18.6% Cr and 4.05—5.2% Ni was attained at a manganese content of 7—10%. Weld metal with manganese content of 13—14% has a satisfactory corrosion-resistance in nitric acid at concentrations up to 56% and temperatures up to 70C. No signs of intergranular corrosion were observed. Orig. art. has: 5 figures and 1 table.

ASSOCIATION: Institut elektrosvar'ki im. Ye. O. Patona AN UkrSSR (Electrowelding Institute; AN UkrSSR)

SUBMITTED: 06May63

DATE ACQ: 24Jun64

ENCL: 00

SUB CODE: MM

NO REF SOV: 00

OTHER: 006

Card 2/2

L 9093-64 EIT(m)/ENP(q)/ENP(b) ASD(r)/AFMD(c)/ASD(m)-3 NJW/JD  
 ACCESSION NO: AP4042256 S/0064/64/000/007/0541/0547

AUTHOR: Yegorov, V. F.; Kruglov, B. I.; Sharonova, T. M.; Babakov, A. A.; Kakhovskiy, M. I.; Brusentsova, V. M.; Vasil'yeva, N. M.; Karava, Ye. V.; Lushchenko, K. A.

TITLE: Industrial use of steels with lowered nickel content

SOURCE: Khimicheskaya promyshlennost', no. 7, 1964, 541-547

TOPIC TAGS: stainless steel, low nickel stainless steel, EP53 stainless steel, EP54 stainless steel, steel composition, steel microstructure, steel mechanical property, steel corrosion resistance, steel weldability, weld metal property, stainless steel corrosion

ABSTRACT: To determine the suitability of low-nickel stainless steels for use in the chemical industry, the corrosion resistance of OKh21N14 (EP-53) and OKh21N6M2T (EP-54) stainless steels has been investigated under laboratory, semi-industrial, and industrial conditions. These specimens, with joints made by means of manual or submerged arc welding, were tested in nitric acid with concentrations of 2-80% at temperatures of 40, 60, and 80C. Metallographic examination of the

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L 9093-65

ACCESSION NR: AP4042254

3  
welded joints of chemical equipment after more than one year of operation revealed no intergranular corrosion of the parent or weld metal, or of the metal in the heat-affected zone. EP-53 steel has satisfactory corrosion resistance in nitric-acid-containing media, in 60% nitric acid at temperatures up to 60°C, in urea solutions up to 120°C, and in acid and alkaline solutions of ammonium nitrate at 80-90°C. EP-54 steel is corrosion resistant in an ammonium-sulfate solution containing up to 20g/l free sulfuric acid at a temperature up to 90°C; it is, however, susceptible to intercrystalline corrosion under conditions of urea synthesis. Test results make it possible to use EP-53 steel as a substitute for EP-54 steel.

y tables and figures.		... additional testing. ...	
ASSOCIATION: IIRK; GIAP; TsNIICHM Institut elektrosvarki im Ye. O. Patona (Institute of Electrical Welding)			
SUBMITTED: 00	ATD PRESS: 3105	ENCL: 00	
SUB CODE: MM, IE	NO REF SOV: 000	OTHER: 000	
Card 2/2			

L 14807-65 EWT(m)/EWA(d)/EWP(v)/EWP(t)/EWP(k)/EWP(b) Pf-4 ASD(f)-2/  
 ASD(m)-3/AFM/G/AFETR MJW/JD/HM  
 ACCESSION NR: AP4047227 S/0125/64/000/010/0035/0040

AUTHOR: Kaklovskiy, N. I. (Candidate of technical sciences);  
Yushchenko, K. A. (Engineer)

TITLE: Effect of ferrite-forming elements on properties of  
 chromium-nickel welds of the 20-5 and 20-7 types

SOURCE: Avtomaticheskaya svarka, no. 12, 1964, 39-40

TOPIC TAGS: chromium steel, nickel containing steel, stainless steel,  
 arc welding, weld metal, structure, mechanical property,  
 corrosion resistance, alloying

ABSTRACT: In a search for electrode wire for mechanized arc welding  
 of ferrite-austenitic, corrosion-resistant Cr-Ni steels, a study has  
 been made of the effect of Ni, Nb, Ti, and Al on the microstructure,  
 mechanical properties, and corrosion resistance in oxidizing media  
 (nitric acid in differing concentrations) of the weld metal of high-  
 chromium steels with various Ni contents. The welds were obtained by  
 the automatic arc welding of grooved OKh21N5T [AISI stainless W] steel  
 plates using IKh21N5T and Sv-06Kh19N9T electrode wires. Powdered Ni,

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L 14807-65

ACCESSION NR: AP4047227

ferroniobium, ferrotitanium, or ferroaluminum were spread in the grooves to obtain weld metal with various contents of Ni, Nb, Ti, and Al. The weld metal was subjected to metallographic examination and tests of notch toughness, impact bend, tension, and corrosion. The test results showed that to ensure the required mechanical properties and corrosion resistance of the welded joints of 21-S type Cr-Ni austenitic-ferritic steels, the weld metal structure should contain 40-60% ferrite. To obtain this amount, a weld with 20-22% Cr and an 8-10 ratio of Ti and Nb to C should have 6-7% Ni. Maximum corrosion resistance of such welds can be achieved by stabilization with Nb or with Nb and Ti, preferably with more Nb than Ti. To reduce the burn-up of Ti and Nb and to facilitate their introduction into the weld during welding in protective media of various oxidizing capacities, the electrode wire should be alloyed with enough Al to obtain a weld metal with max 0.2% Al. Orig. art. has: 7 figures.

ASSOCIATION: Institut elektrosvariki im. Ye. O. Patona, AN UkrSSR (Electric Welding Institute, AN UkrSSR)

Card 2/3

L 14807-65

ACCESSION NB: AP4047227

SUBMITTED: 11 Oct 63

ENCL: 00

SUB CODE: MM, LZ

NO REF SOV: 002

OTHER: 000

ATD PRESS: 3140

Cord 3/3

L 23330-65 EWT(m)/EWA(d)/EWP(t)/EWP(b)  
ACCESSION NR: AP5001191

JD/WB

S/0125/64/000/012/0030/0037

AUTHOR: Kakhovskiy, N. I. (Candidate of technical sciences); Langer, N. A.  
(Candidate of technical sciences); Yushchenko, K. A. (Engineer); Chalyuk, G. I. (Eng.)

TITLE: Electrochemical properties of the weld compounds of ferritic-austenitic  
chromium-nickel steel of 21-5 type

SOURCE: Avtomaticheskaya svarka, no. 12, 1964, 30-37

TOPIC TAGS: welding compound, ferritic austenitic steel, chromium nickel  
steel, electrochemical property, steel, macrocell, steel welding

ABSTRACT: The electrochemical properties of the weld compounds in steels  
were investigated, and it was found that they depend on the chemical composition  
of the welded seam, the grain size, and the steel properties resulting from the  
welding temperature, aggressiveness of the medium, and some other factors. In  
the boiling solution of 40% nitric acid, macrocells consisting of the base metal-  
seam and base metal-zone of thermal influence may be formed. If the joint dif-  
fers little from the base metal, the corrosion resistance is determined by the

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L 23330-65  
ACCESSION NR: AP5001191

corrosion current in the macrocell base metal-zone of thermal influence. It was experimentally confirmed that the difference of the chemical composition and surfaces of ferritic and austenitic phases in the metal affects its structurally selective corrosion in nitric acid of higher concentration and temperature. Orig. art. has: 5 figures and 5 tables

ASSOCIATION: Institut elektrosvarki im. Ye. O. Patona AN UKrSSR (Institute of Electric Welding AN UKrSSR)

SUBMITTED: 02Mar64

ENCL: 00

SUB CODE: MM, CC

NR REF SOV: 011

OTHER: 001

Card 2/2

ACCESSION NR: AP4013079

S/0125/64/000/002/0023/0029

AUTHOR: Kakhovskiy, N. I.; Ponizovtsev, A. M.

TITLE: Effect of some hardening and stabilizing elements upon the microstructure and properties of high-chromium heat-resisting steel welds

SOURCE: Avtomaticheskaya svarka, no. 2, 1964, 23-29

TOPIC TAGS: welding, steel welding, heat resisting steel welding, high chromium weld, heat resisting steel weld, steam turbine steel

ABSTRACT: An experimental investigation of the effect of C, W, V, Nb, and Ti upon the microstructure, short-time mechanical properties, and long-time strength of a weld metal containing 10-12% Cr is reported. It is found that the contents of the above elements should be such that both the formation of a structurally free ferrite and the solving V in the solid solution are precluded. Experimental multilayer welds were produced with 15Kh1MF steel by arc welding in CO<sub>2</sub> with

Card 1/2

KAKHOVSKIY, N.I.; PONIZOVTSSEV, A.M.; ANDRIYEVSKIY, R.A.; SOLONIN, S.M.

Welding porous, high-alloy, Kh17N2 steel. Porosh.met. 4 no.4:91-96  
J1-Ag '64. (MIRA 18:8)

1. Ordena Trudovogo Krasnogo Znameni Institut elektrosvarki imeni  
Patona AN UkrSSR i Institut problem materialovedeniya AN UkrSSR.

L 29929-65 EPF(n)-2/ENP(k)/EWT(m)/ENP(h)/T/ENP(d)/ENP(r)/ENP(t) Pr. 4/P. 4  
 ACCESSION NR: AP5002888 IJP(c) M.N/3D/HMS/0135/65/000/001/0022/0023

JG

AUTHOR: Kalchovskiy, N.I. (Candidate of technical sciences); Didabulidze, D. V.  
 (Engineer)

TITLE: Arc welding of Kh25T steel, 4

SOURCE: Svarochnoye proizvodstvo, no. 1, 1965, 22-23

TOPIC TAGS: welding, steel welding, automatic welding, manual welding, stabilized  
 seam, arc welding/steel Kh25T

ABSTRACT: The ferrite steel Kh25T is used in machine-building and other industrial applications for the production of equipment which can operate under moderate loads at temperatures up to 1100C. The article describes the technology of automatic (with fusing agents) and manual arc welding of Kh25T. The automatic devices utilized chrome-nickel wires of type 25-28, 25-13, or 25-12 in conjunction with fusing agents used during the welding of stainless steel. Manual welding used EA2-type electrodes (from 25-13 wires). In the case of products earmarked for operation within aggressive media, one should utilize austenite wires in conjunction with electrodes which stabilize the metal seam with titanium or niobium. Fixed joints thicker than 10 mm should be welded with a preliminary local heating of the sample up to 150-200C. Orig. art. has: 4 figures and 2 tables.

Card 1/2

L 29929-65

ACCESSION NR: AP5002888

ASSOCIATION: Institut elektrosvarki Im. Ye. O. Patona (Electric welding Institute)

SUBMITTED: 00

ENCL: 00

SUB CODE: MN, IE

NO REF SOV: 002

OTHER: 000

Card 2/2

L C0997-66 EPA(s)-2/EWT(m)/EPF(c)/EPF(n)-2/EWA(d)/ENP(v)/T/ENP(t)/ENP(k)/  
 ENP(z)/ENP(b)/EWA(c) LJP(c) JD/HM/JG/WE  
 ACCESSION NR: AP5018696

UR/0125/65/000/007/6915/0018  
 621.791.053:546(821+882)

5-7  
 5/

AUTHOR: Kakhovskiy, N. I. (Candidate of technical sciences); Fartushnyy, V. G.  
 (Engineer); Manzheley, G. P. (Engineer)

TITLE: Effect of titanium and niobium on properties of chromium-nickel-manganese  
steel/welds

SOURCE: Avtomaticheskaya svarka, no. 7, 1965, 15-18

TOPIC TAGS: chromium steel, nickel containing steel, nitrogen containing steel,  
manganese containing steel, steel welding, weld metal property, weld metal corrosion  
resistance, niobium addition effect, titanium addition effect

ABSTRACT: The effect of the additions of 0.30—1.00% Ti and/or 0.52—1.48% Nb on the  
 microstructure, mechanical properties, and corrosion resistance (in nitric acid) of  
 welded Cr-Ni-Mn and Cr-Ni-Mn-N steels containing 0.045—0.10% C, 15.9—17.8% Cr,  
 3.10—4.50% Ni, and 0—0.151% N has been investigated. Additions of Ti and/or Nb  
 increased the amount of the ferrite phase in the weld metal, the grain size, and  
 the yield strength, and decreased the tensile strength and ductility of the weld  
 metal. Additions of Nb lowered the weld metal ductility more than additions of Ti.

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L 00997-66

ACCESSION NR: AP5018696

6

This is explained by a more uniform distribution of Ti within the metal grains in contrast to the distribution of Nb in the form of chain-like segregations along the grain boundaries. In steels with a comparatively higher content of austenite-forming elements (Ni and Mn), additions of Ti and Nb (in the amounts investigated) produced smaller increases in the amount of the austenitic phase in the weld metal and had only a slight effect on its strength and ductility. In nitrogen-containing steels, additions of Nb had practically no effect on the finely dispersed structure and mechanical properties of the weld metal. This means that the ductility of the weld metal of niobium-modified Cr-Ni-Mn steels can be increased by alloying with nitrogen. With increasing Ti or Nb content, corrosion resistance of the weld metal of Cr-Ni-Mn steels in 30, 40, and 50% HNO<sub>3</sub> changed insignificantly at temperatures up to 500, and rather sharply at 700. To prevent intercrystalline corrosion and to ensure the optimal mechanical properties and general corrosion resistance, Cr-Ni-Mn steel welds should contain 0.6—0.9% Ti or 0.8—1.0% Ni. In simultaneous alloying of the welds with Ti and Nb, the amount of these elements should be reduced correspondingly. Orig. art. has: 6 figures and 2 tables. [MS]

ASSOCIATION: Institut elektrosvariki im. Ye. O. Patona, AN UkrSSR  
(Electric Welding Institute AN UkrSSR) 44.55

Card 2/3



L 00997-64  
ACCESSION NR: AF5018696

SUBMITTED: 27Jan65

ENCL: 00

SUB CODE: MM, IE, 0

NO REF SOV: 007

OTHER: 001

ATD PRESS: 4068

*KC*  
Card 3/3



L 22025-66 EWT(m)/EWP(w)/EPF(n)-2/EWA(d)/ENP(v)/T/EWF(t)/EWP(k) IJH(c)

ACC NR: AP6007919 JD/HM/JG/WB SOURCE CODE: UR/0125/66/000/002/0029/0034

AUTHOR: Kakhovskiy, N. I.; Didebulidze, L. V.

ORG: Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR (Institut elektros-  
varki AN UkrSSR)

TITLE: Arc welding of 17% chromium steels

SOURCE: Avtomaticheskaya svarka, no. 2, 1966, 29-34

TOPIC TAGS: arc welding, chromium steel, stainless steel, ferritic steel, corrosion  
resistance, titanium, phase analysis /Kh17 chromium steel, Kh17M2T chromium steel,  
0Kh17T chromium steel, Kh17M2T chromium steel

ABSTRACT: Stainless high-chromium steels Kh17, 1Kh17T, 0Kh17T, and Kh17M2T (0.05-  
0.12% C, 0.22-0.60% Mn, 0.10-0.50% Si, 16.5-17.4, 0.19-0.98% Ni, 0-0.49% Ti, 0-1.94  
Mo) which belong in the ferritic class and, compared with austenitic Ni-Cr steels,  
display a higher yield strength but lower ultimate strength and impact toughness.  
were investigated for weldability. The joints were welded by means of automatic  
submerged arc welding with ferritic and austenitic electrodes. Resistance to general  
and intercrystalline corrosion following welding as well as following tempering at  
650 and 770°C for 2 hr or water quenching from 1250-1300°C for 3-5 sec or 1 hr was  
determined by boiling in CuSO<sub>4</sub> and 50% HNO<sub>3</sub>. It is established that the Ti-free steels  
when used as the metal of the weld and near-weld zone display a lower corrosion re-

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UDC: 621.791.0:620.193.4

L 22025-66

ACC NR: AP6007919

distance in boiling  $\text{HNO}_3$ <sup>27</sup> compared with the base metal which did not undergo heating during welding and their corrosion is mostly of the intercrystalline kind. On the basis of an analysis of electrolytically segregated carbides, electronmicroscopic analysis of grain boundaries and measurements of microhardness it is established that the principal cause of the intercrystalline corrosion of ferritic 17% Cr steels following their rapid quenching from high temperatures lies in the rise of stresses in the lattice of the surface layers of the ferritic grains owing to incomplete segregation of the carbonitride phase during the quenching. By contrast, Ti<sup>27</sup> or Nb<sup>27</sup>-stabilized Cr-Ni austenitic-ferritic welds both in the post-welding state and after tempering at 770°C display a sufficiently high corrosion resistance. These findings point to the advisability of welding ferritic steels by means of coated welding wire and electrodes enriching the weld metal with stabilizing elements (Ti, Nb) in the quantities required for complete binding of C. Orig. art. has: 3 figures, 5 tables.

SUB CODE: 11, 13 20/ SUBM DATE: 15Sep64/ ORIG REF: 006/ OTE REF: 002

Card

2/2

L 35817-66 EWT(m)/T/EWP(w)/EWP(t)/ETI LIP(c) JD/HW/JD  
ACC NR: AP6015244 (N) SOURCE CODE: UR/0123/56/800/003/0026/0030

AUTHOR: Kakhovskiy, N. I.; Yushchenko, K. A.

ORG: Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR (Institut Elektrosvaraki AN UkrSSR)

TITLE: Effect of nickel on the microstructure and properties of welded seams containing 20-22% chromium

SOURCE: Avtomaticheskaya svarka, no. 5, 1966, 26-30

TOPIC TAGS: ferritic steel, austenitic steel, nickel steel, chromium steel, arc welding, weld evaluation, corrosion resistance/OKh21N3T steel, OKh21N5T steel, O6Kh19N9T steel

ABSTRACT: The mechanical and corrosion properties of Cr-Ni two-phase welded seams depend on the ratio between the amount of ferrite and austenite they contain. In this connection, it was of interest to determine more precisely this ratio as well as the optimal content of Ni in seams of this kind. Seams containing from 3 to 12% Ni were arc-welded on plates of OKh21N3T and OKh21N5T steels by means of electrodes of OKh21N3T, OKh21N5T and O6Kh19N9T steels. Specimens of these seams were tested for intercrystalline corrosion and impact strength. The amount of the ferritic phase was

Card 1/2

UDC: 621.791.011:669.15-194:669.26:539.4

L 35817-66

ACC NR: AP6015244

determined by the magnetometric method and by metallographic analysis. Findings: the seams with optimal mechanical properties contain 20-22% Cr and 5-7% Ni, which corresponds to a content of 40-60% of the ferritic phase; such an amount of this phase in the seam may be assured by maintaining the ratio of austenite-forming elements to ferrite-forming elements,  $Ni_{equiv}/Cr_{equiv}$ , at 0.30-0.40. Seams containing less than 4.5% Ni are more prone to intercrystalline corrosion, owing to the formation of a Cr- and Ni-poor third phase representing the product of  $\gamma \rightarrow \delta$  transformation. These findings have made it possible to determine the optimal chemical composition of the metal as well as the composition of electrode wire of the 22-8 type for the arc welding of Cr-Ni ferritic-austenitic steels of the 21-5 and 21-6 types. Orig. art. has: 8 figures and 1 table.

SUB CODE: 13,11,20/ SUBM DATE: 18Nov65/ ORIG REF: 008

Card 2/2

L 41262-66 EWT(m)/EWP(w)/EWP(v)/I/EWP(t)/ETI/EWP(2) IJP(1) ID/PW  
 ACC NR: AP6021007 (N) SOURCE CODE: UR/0125/66/000/006/0050/0054 34  
 AUTHOR: Kakhovskiy, N. I.; Ponizovtsev, A. M.; Vivsik, S. N.; Nikolayenko, M. R. 36  
 ORG: [Kakhovskiy, Ponizovtsev] Institute of Electric Welding im. Ye. O. Paton, AN UkrSSR  
 (Institut elektrosvarki im. Ye. O. Patona AN UkrSSR); [Vivsik, Nikolayenko] Podol'sk Plant  
 im. Ordzhonikidze (Podol'skiy zavod im. Ordzhonikidze) 8  
 TITLE: Welding of EI756 high-temperature chromium steel  
 SOURCE: Avtomaticheskaya svarka, no. 6, 1966, 50-54  
 TOPIC TAGS: high temperature chromium steel, welding flux, welding electrode, steam  
 auxiliary equipment/EI756 (IKh12V2MF) high-temperature chromium steel, AN-17 welding  
 flux, EP-249 welding electrode, EP-390 welding electrode  
 ABSTRACT: EI756 (IKh12V2MF) high-temperature chromium steel belongs in the martensitic-  
 ferritic class and is used to manufacture the blades of steam and gas turbines as well as  
 superheater tubes and steam lines. The article deals with the problem of selecting a flux  
 which, in a combination with the use of specially developed EP-249 and EP-390 wire elec-  
 trodes, would assure optimizing the chemical composition of the weld metal. Experiments  
 Card 1/2 UDC: 621.791.7:669.15-194:669.26

L 41269-66

ACC NR: AP6021007

with the butt welding of 36 mm thick joints of EI756 steel showed that the AN-17 low-silicon oxidizing flux is the most suitable for this purpose and facilitates best the separation of the slag crust, and that EP-390 electrode wire (Nb-free) is superior to EP-249 electrode wire, since Nb-free welds display a stress-rupture strength of 10 kg/mm<sup>2</sup> after 100,000 hr at 600°C and, moreover, during long-time tests, they display higher plasticity and impact strength. The optimal parameters of the butt welding of tubes measuring 273x36 mm in diameter were found to be: welding current 200-220 a, voltage 28-30 v, welding rate 10-12 m/hr (such a moderate of automatic welding regime is a prerequisite for obtaining a weld metal that is free of hot cracks), with slow subsequent cooling (by not more than 150°C/hr). The cooling is followed by tempering at 740-760°C for 5 hr. The metal of the resulting weld displays satisfactory short- and long-time mechanical properties. Orig. art. has: 6 figures and 4 tables.

SUB CODE: 13,11/

SUBM DATE: 25June65/

ORIG REF: 004

Card 2/2 *LC*

L 04656-67 -- ENP(K)/ENT(P)/T/ENP(V)/EMP(T)/STI -- IJP(C) -- JD/AM

ACC NR: AP6914435

(N) SOURCE CODE: UR/0125/65/000/012/0012/0017

AUTHORS: Fartushnyy, V. G.; Kakhovskiy, N. I.; Babakov, A. A.; Fedorova, V. I. <sup>4/3</sup>  
<sub>4/1</sub>

ORG: Fartushnyy, Kakhovskiy Institute of Electro-Welding im. Ye. O. Paton, AN <sup>B</sup>  
UkrSSR (Institut elektrosvarki AN UkrSSR); Babakov, Fedorova/ TsNIICM

TITLE: Austenitic chromium-manganese-nitrogen steel and its welding technology, <sup>4</sup>

SOURCE: Avtomaticheskaya svarka, no. 12, 1965, 12-17

TOPIC TAGS: <sup>steel, austenitic steel,</sup> alloy steel, metal welding, weldability, automatic welding, seam welding/ Kh17AG14 steel, ST-3 steel

ABSTRACT: A technique for welding steel Kh17AG14 <sup>4</sup> and a combination of the latter with steel St3 in the presence of flux and of different inert gases (CO<sub>2</sub>, argon) was developed. In addition, the usual mechanical properties and magnetic permeability, as well as the microstructure, of the steel Kh17AG14 were determined. The experimental results are presented in graphs and tables (see Fig. 1). It was found that steel Kh17AG14 possesses high plasticity but tends towards embrittlement in the temperature interval 600--800C. Welding of the steel should be carried out <sup>1</sup> with electrodes having the same composition as the steel or, in some cases, with the OKh18N9FBS rod. Welding of the combination Kh17AG14 -- St3 may be carried out <sub>16</sub>

Card 1/2

UDC: 621.791 (756+856).669.140

L 04666-67 ENT(m)/EWP(t)/ETI IJP(c) JD/HW/WB

ACC NR: AP6007107

SOURCE CODE: UR/0129/66/000/002/0029/0032

AUTHORS: Langer, N. A.; Yagupol'skaya, L. N.; Kakhovskiy, N. I.; Yushchenko, K. A.; Fartushnyy, V. G.; Chalyuk, G. I.

ORG: Institute of Electro-Welding im. Ye. O. Paton, AN UkrSSR (Institut elektrosvarki AN UkrSSR)

TITLE: Corrosion resistance of steel with low nickel content in aggressive media 65

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 2, 1966, 29-32 63

TOPIC TAGS: corrosion resistant alloy, stainless steel, chromium steel alloy, nickel containing alloy, molybdenum containing alloy B

ABSTRACT: The effect of the chemical composition of stainless steel with low Ni content upon its corrosion resistance has been studied. The investigated steels were: OKh21N3T, OKh21N5T, OKh21N6M2T (I), Khl4G14N3T, and Khl7AG14. Corrosive media selected were: 0.5N iron chloride solution, 3% solution of sodium chloride, 20% nitric acid, and sea water. Steel I, which contains 21% Cr, 6% Ni, and 2% Mo, was found to be most resistant to pitting under the described conditions. In general, it was established that resistance of heterogeneous ferrito-austenitic stainless steel to pitting is secured by an increase in Cr content and the presence of Mo.

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UDC: 669.14.018.84.621.785



L 04666-67

ACC NR: AP6007107

Thus, it is possible to substitute for the chrome-nickel steels of Kh18N10T type<sup>1/6</sup> <sup>1/6</sup> 2  
by steels with a low Ni content in a variety of listed corrosive media. Orig.  
art. has: 3 tables and 3 figures.

SUB CODE: 11,07 SUBM DATE: none/

ORIG REF: 005/

OTH REF: 004

kh

Cord 2/2

KAKHOYAN, G.

On the right track. Okhr. truda i sots. strakh. 5 no.8:23-25 Ag 162.

(MIRA 15:7)

(Moscow--Machinery industry--Hygienic aspects)

L 63097-63 ENT(m)/ENG(m)/ENF(t)/ENF(b) IJP(c) RDN/00

ACCESSION NR: AP5019922

UR/0202/65/000/000/0100/0102

AUTHOR: Chiriyeva, Ye. A.; Kakhromanov, K.; Kutasov, V. A.; Kuliyev, Kh. M.

TITLE: Thermal conductivity of solid solutions based on bismuth telluride

SOURCE: AN Turkmen SSR. Izvestiya. Seriya fiziko-tekhnicheskikh, khimicheskikh i geologicheskikh nauk, no. 4, 1965, 100-102

TOPIC TAGS: thermal conductivity, bismuth telluride, bismuth selenide, antimony telluride, antimony selenide, electric conductivity, forbidden gap width, heteromorphism, isomorphism

ABSTRACT: An attempt was made to compare the thermal conductivity of the lattice of solid solutions based on  $\text{Bi}_2\text{Te}_3$  formed by isomorphous substitution ( $\text{Bi}_2\text{Se}_3$ ,  $\text{Sb}_2\text{Te}_3$ ) and heteromorphous substitution ( $\text{Sb}_2\text{Se}_3$ ). Oriented crystals grown by Bridgman's method were used. The content of the second component of the solution ( $\text{Bi}_2\text{Se}_3$ ,  $\text{Sb}_2\text{Te}_3$ ,  $\text{Sb}_2\text{Se}_3$ ) was 10 mole %. The thermal conductivity, electrical conductivity, and thermo-emf coefficient were measured at 300-700K. The thermal conductivity of the lattice was found to decrease from solid solutions of isomorphous compounds ( $\text{Bi}_2\text{Te}_3$ - $\text{Bi}_2\text{Se}_3$ ,  $\text{Bi}_2\text{Te}_3$ - $\text{Sb}_2\text{Te}_3$ ) to those of heteromorphous compounds ( $\text{Bi}_2\text{Te}_3$ - $\text{Sb}_2\text{Se}_3$ ). The role of ambipolar diffusion in the

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ACCESSION NR: AP5019922

solid solution based on the heteromorphous compounds is much smaller than in the solutions of isomorphous compounds. It is postulated that this decrease is due not only to a large forbidden gap width, but also to the ratio of mobilities of the majority and minority carriers. Orig. art. has: 3 figures and 4 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN Turkmensoy SSR (Physicotechnical Institute, AN Turkmen SSR)

SUBMITTED: 06Jan65

ENCL: 00

SUB CODE: SS, EC

NR REF SOV: 003

OTHER: 003

Card 2/2